



# International Journal of Supply Chain Management

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Date: 18<sup>th</sup> February, 2017

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Subject: Acceptance Letter

Dear **Rochman Marota, Hamzah Ritchi, Uswatun Khasanah** and **Rizky Fisa Abadi**:

Congratulations!

Your Manuscript entitled “*Material Flow Cost Accounting Approach for Sustainable Supply Chain Management System*” has been accepted with minor modifications for Volume 6, Number 2 of *International Journal of Supply Chain Management (IJSCM)* [ISSN 2050-7399 (Online), 2051-3771 (Print)] that would be published on June 2017. As per reviewers’ comments which are defined at the email, you have to submit final manuscript (edited version) within **25<sup>th</sup> February, 2017**.

Your Journal paper would be indexed in **Scopus (Elsevier)**, DOAJ, EBSCO, Google Scholar, Scirus, GetCited, Scribd, Citeseerx, Newjour and so on.

We look forward to receiving your subsequent research papers.

Best Regards,

M. Habib

**Assoc. Prof. Dr. Md. Mamun Habib**

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*International Journal of Supply Chain Management (IJSCM)*

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Dear Authors:

As per requirement to support this open access journal, we have to charge 200 USD (*excluding transfer fee*) for an accepted manuscript to publish it at Volume 6, Number 2 of IJSCM.

Please transfer the payment of **200 USD** (*excluding transfer fee*) within **February 25, 2017** by Bank Transfer or Western Union/Money Gram.

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### Option 2 (Western Union/Money Gram):

Name: Md. Mamun Habib  
Location: Dhaka, Bangladesh

We look forward to seeing your further co-operation.

Best Regards,

M. Habib

**Assoc. Prof. Dr. Md. Mamun Habib**

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## PEMBAGIAN TUGAS DRAFTING JURNAL INTERNATIONAL

**Tujuan Jurnal:** *International Journal of Supply Chain Management (IJSCM)*, peer-reviewed indexed Journal [ISSN: 2050-2050-7399 (Online), 2051-3771 (Print)]

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E-mail: [mamunhabib@gmail.com](mailto:mamunhabib@gmail.com), [mamunhabib@bracu.ac.bd](mailto:mamunhabib@bracu.ac.bd)

**Important Dates :** *Volume 6, Number 2, June 2017*

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No.	NAMA	TUGAS	TARGET	KETERANGAN
1.	Dr. Hamzah Ritchi	<ul style="list-style-type: none"><li>Review Initial Draft</li><li>Feedback</li><li>Review Final Draft</li></ul>	Mulai 23 Des Mulai 26 Des	
2.	Rochman	<ul style="list-style-type: none"><li>Perubahan konsep MFCA, mencari pengaruhnya ke arah Sustainable Supply Chain Mgt (SSCM)</li><li>Sintesa SSCM dan menghubungkannya dengan MFCA</li><li>Submit to Editor-Chief</li></ul>	Mulai 20 Des Mulai 20 Des Tanggal 31 Des	Done
3.	Uswatun	<ul style="list-style-type: none"><li>Mencari bahan materi SSCM</li><li>Merapihkan format draft text jurnal</li></ul>	Mulai 20 Des Mulai 21 Des dan setelah feedback dan review final draft dari Pak Ritchi	
4.	Rizky	<ul style="list-style-type: none"><li>Mencari bahan materi SSCM</li><li>Translate to English</li></ul>	Mulai 20 Des Mulai 22 Des	

# Material Flow Cost Accounting Approach ~~in~~for Sustainable Supply Chain Management System<sup>\*</sup>

Rochman Marota<sup>1)</sup>, Hamzah Ritchi<sup>2)</sup>, Uswatun Khasanah<sup>3)</sup>, Rizky Fisa Abadi<sup>4)</sup>

<sup>\*</sup> This research was funded by Indonesia Endowment Fund for Education (LPDP)

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Staff at Indonesia Ministry of Religious Affairs

**Abstract** — The purpose of this paper is to examine whether material flow cost accounting (MFCA) can help generate innovation in supply chain management while playing its essential role. Full descriptive studies for reducing material losses through as described in this paper was employed to inspect whether MFCA approach would achieve reduction in material losses among multiple suppliers through efforts by the buyer. Both MFCA and supply chain management are strategic competitive tools for companies that solve logistical problems as a strategy to win the global competition. There is collaboration between MFCA approach and supply chain management as an integrated system. The constraints ~~in~~of combining supply chain management system ~~to~~combine with MFCA approach are technological developments and capabilities, environmental issues, global business competition, and the different point of view related to choice for responsive or efficient in business strategy.

**Keywords**—MFCA, supply chain management, strategic competitive tools, integrated system, business strategy

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## 1. Introduction

In the concept of sustainable development, the process of development is expected can meet the need of present life without gives an adverse impact to the needs of future generation in utilizing the potential natural resources efficiently and effectively. In the company, the problem of efficiency and effectiveness of the use of natural resources, especially in the cost of production always becomes a ~~highlight~~highlight by the financial report users. According to [11], production cost is the component of the main cost in manufacture's company. The company should focus on the efficiency of the natural resources to minimize the production cost. The argument about efficiency of natural resources especially related with the

reduction and management of waste not only concern for scientists and environmental activist, but also the management executives [5]. Management is aware and has understood that traditional accounting system currently has limitations. The limitations will be felt when the accounting system is related with the business operations that associated with environmental management. The costs generally related to management waste, waste disposal, installation development, fees to the third parties, licensing fees, and others.

In attempts to contribute on the problem of reducing waste from different perspective, contemporary accounting management tool has been developed, namely Material Flow Cost Accounting (MFCA). The tool functions as an information provider ~~of~~beare it financial and non-financial in order to support the decision on reducing waste by managers. MFCA particularly aims to manage the process of manufacturing related with material flow, energy, and data, thereby achieving a more efficient and appropriate manufacturing process with the target that had been determined [7, 16]. The advantages of using MFCA concept is that it can potentially increase the profit and productivity (internal benefit) and also decrease an adverse effect toward the environment (external benefit) which further contributes in corporate sustainability development. [2] showed that the concept of corporate sustainable development is growing in last decade and has been the center of attention for ~~business sector, and business world~~. [1] mentions that there are 5 (five) elements for company organization in developing sustainable environment, namely sustainable economy, social indicators, environment analysis, sustainable indicators which are selected independently and the material and resource used.

Among the prior study about MFCA is one that has been conducted by [11]. They conduct a research to design and implement MFCA in a factory processing palm oil CPO to know its effect toward increasing the company's ~~sustainability~~. It was shown that there was significant influence between implementation of MFCA and company's sustainability. [3] also conducts a MFCA-based research by adopting and adjusting the framework

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**Commented [hr3]:** Saya kira penting untuk dijelaskan dalam satu kalimat apa yang dilakukan MFCA bagi costing dan potensi nya bagi SCM. **Noted Pak, akan ditambahkan.** Sudah ditambahkan?

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**Commented [hr5]:** Tolong dicek apakah ada dimensi sustainability khusus yang dibahas? **Tidak ada Pak, penelitian tersebut membahas semua dimensi keberlanjutan dari ekonomi, sosial, lingkungan dan teknologi.**

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of MFCA in supporting the management's decision of reducing waste. The result showed that there was an influence on the use technology and tool of management accounting in supporting the process of decision making of company management for reducing waste. Another study focusing on detection model of MFCA with environmental ~~accounting~~ ~~shows~~ ~~accounting~~ ~~shows~~ that MFCA could be a model for detecting the production and company's business at the same time [10].

## 2. Material Flow Cost Accounting (MFCA)

MFCA is a management information system that explores all input materials that flows during production process, and measures the output in final product and its waste. Moreover, [9] explain that the MFCA method will explore in detail the physical flow of material in production ~~process~~ ~~process~~; started from input, work in process, and final product. Then it calculates the cost of material by multiplied and qualified it to the other cost. [16] show an important idea from MFCA. In classic cost accounting, all of the costs are only allocated for production as a whole cost [10]. According to them, MFCA will divide the material cost into production cost and waste material; it depends on where the material will end. ~~Besides, the costing system that can be produced in the company is based on the storage, process or transportation will be added.~~ MFCA is developed because in conventional cost accounting, the potential of transparent information about the material's flow and energy ~~includes~~ ~~ing~~ —the management supporting decision related to increase the efficiency of material and energy used, are limited. In conventional cost accounting, the cost of material and energy lost usually are not counted. Because the material costs become the dominant costs that can be allocated directly to production cost, the costs will directly charge the cost center in the company's cost of goods sold. Therefore, the company management will directly focus to reduce it. Moreover [7]-[8], [16] categorized MFCA as a management supporting tool that shows the material's flow by focusing on the importance of information to optimize the production process. Its purpose is to serve a system on output of the final items and show the importance of data collected from the MFCA system to optimize the manufacturing process.

## 3. Sustainable Supply Chain Management

The world economy continues to grow, a clear positive impact on the level of welfare of the world, also produce negative effects on and environmental factors are very close relation to social factors of a nation. One that affects the country's economic growth is the sector transportation [15]. That is the importance of sustainable supply chain management concept. [2] describes sustainable supply chain management as the development

of science in supply chain itself, in order to sustainable, it has to meet three main factors in terms of economic, social and environmental, as shown in Figure 1.

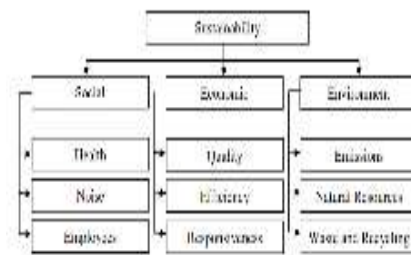


Figure. 1. Matrix Dimensions and Sub-Dimension of Sustainable Supply Chain

The success or failure of implementing a management strategy consists of the following four factors [13]:

1. The suitable company's strategy to face the business competition;
2. Supply chain strategy;
3. How to connect between corporate strategy and supply chain strategy; and
4. How to make it possible in sustainability.

Supply chain management came into prominence during the years 1980-1990, due to business interests in logistics and operations management [6]. The most fundamental thing in implementation of supply chain management is how it can meet the demand of the market is very volatile, operational challenges, and face as well as adjusting for development in the chain of supply is itself such as environmental issues, and onwards. Five scope~~s~~ of the decision ~~is-are~~ usually taken by the company, as shown in Figure 2. In terms of the application of the supply chain, whether taken individually or ~~in~~-collectively:

1. Production, how relates to any product desired by the market? How many products have to be made either in the number or type and when being produced?
2. Inventory, relate~~s~~ to what items should be saved in a number of in particular? With the criteria such as how much to the raw materials, semi-finished and finished goods?
3. Location, with respect to which a production facility and warehouse should be placed? Where a production facility and warehouse has to offer the most cost-efficient?
4. Transportation, dealing with how the movement of goods or material from one chain to the next chain?
5. Information, how much data needs to be collected and shared?
6. How fast and accurate information between the coordination and decision-makers?

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Commented [hr8]: Maksudnya "including"? **Yes, including**

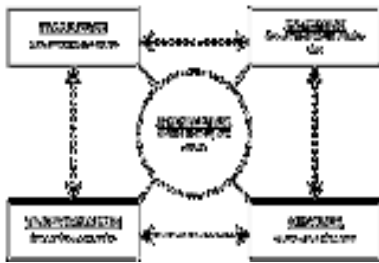


Figure 2. Supply Chain Drivers

According to [6] there are three steps in connecting between Supply Chain with Business Strategy, as follows:

1. What are needed by the market?
2. What are the core competencies of an enterprise that will provide services to the market?
3. How to increase the level of capability that owned a chain supply company to support the many options that can be given to provide the best service to the market?

Those steps explain a different point of view related to choice for responsive or efficient in business strategy, as shown in Table 1.

Table 1. Responsiveness vs Efficiency

Supply Chain Drivers	Responsiveness	Efficiency
Production	<ul style="list-style-type: none"> <li>• Excess Capability</li> <li>• Flexible manufacturing</li> <li>• Many smaller factories</li> </ul>	<ul style="list-style-type: none"> <li>• Little excess capability</li> <li>• Narrow focus</li> <li>• Few central plants</li> </ul>
Inventory	<ul style="list-style-type: none"> <li>• High inventory levels</li> <li>• Wide range of item</li> </ul>	<ul style="list-style-type: none"> <li>• Low inventory levels</li> <li>• fewer items</li> </ul>
Location	<ul style="list-style-type: none"> <li>• Many location close to customers</li> </ul>	<ul style="list-style-type: none"> <li>• Few central location serve wide areas</li> </ul>
Transportation	<ul style="list-style-type: none"> <li>• Frequent Shipments</li> <li>• Fast and flexible mode</li> </ul>	<ul style="list-style-type: none"> <li>• Shipments few, large, slow, chapter mode</li> </ul>
Information	<ul style="list-style-type: none"> <li>• Collect and share timely accurate data</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of information drops while others cost rise</li> </ul>

4. Discussion

4. MFCA Approach in Supply Chain Management

Build on the According to [13]'s work, we attempt to introduce ~~1~~, when introducing MFCA into supply chain management system. ~~The~~ ~~he~~ objective of ~~constructing~~ ~~is~~ ~~to~~ ~~achieve~~ a low-carbon supply chain and ~~to~~ ~~emphasize~~ ~~points~~ ~~to~~ the necessity of raising awareness of environmental issues ~~and~~. ~~The~~ ~~proposed~~ ~~approach~~ ~~is~~ ~~also~~ ~~to~~ ~~encourage~~ ~~ing~~ information sharing with suppliers, ~~e.g.~~, ~~mainly~~ ~~boosting~~ ~~the~~ ~~role~~ ~~of~~ ~~their~~ ~~the~~ purchasing departments. ~~P~~ ~~their~~ ~~study~~ ~~shows~~ ~~that~~ ~~purchasing~~ departments at present ~~are~~ ~~is~~ not prepared to deal with environmental issue ~~that~~ related to external benefit of MFCA concepts. [12] outlined the global cooperation between supplier and buyer in supply chain management system in technological development. ~~It~~ ~~is~~ ~~indicated~~ ~~The~~ ~~result~~ ~~of~~ ~~[14]~~ ~~research~~ ~~indicate~~ that the impact of introducing MFCA in supply chains is different from the effect of its introduction in individual companies [14]. In addition, the analysis showed ~~that~~ there is significant potential to improve losses by changing the raw material in the supply chain. These factors indicate that introducing MFCA in the supply chains has proved to be beneficial so far.

Based on [17] ~~research~~, ~~said~~ ~~that~~ MFCA is applicable to the entire supply chain, covering the extraction of resources to the disposal of products, which is beyond the scope of the single organization. Figure 3 shows the MFCA application to individual organization relates to cost reduction and environmental management as well as MFCA application to supply chain management related to solving technical issues of competitiveness, enhancement of material productivity and business sustainability. MFCA has significant improvement that can be generally considered more widely than other existing productivity management approaches in supply chain management system.

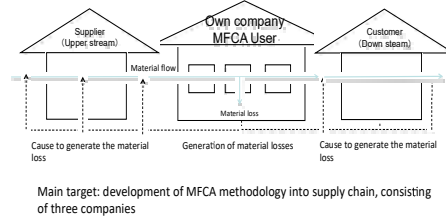


Figure 3. Visualization of MFCA in Supply Chain

Conclusion and Discussion

There is ~~potential~~ collaboration between MFCA approach and supply chain management as a system. All information provided by MFCA ~~consist~~ ~~consists~~ of cost information ~~is~~ useful for decision-making within organizations, while price information is useful for decision-making about clients. But both cost and price are involved in collaboration between buyers and suppliers, and need to be systematized as information useful for decision-making.

**Commented [hr10]:** Please consider revising the sentence. Saya ga faham maksudnya. Penelitian ini memperkenalkan MFCA ke dalam Supply Chain System untuk mengurangi dampak polusi CO2 dari proses produksi. Menurut mereka, bagian proses produksi yang sangat berperan adalah bagian pembelian yang berhubungan dengan Supplier.

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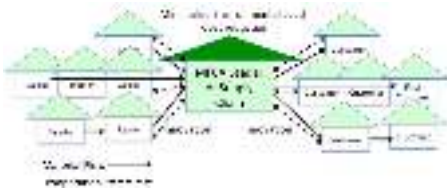


Figure 4. MFCA Leader of Supply Chain

We need an integrated system among that leads the supply chain management environment as shown in Figure 4. This system as shown in Figure 5, shall be synergized into Enterprises Resources Planning (ERP) as the integration of all information systems management and accounting to aid management in decision making, especially regarding information production waste, the cost of material loss, and the efficiency of production, to produce a product that is environmentally friendly and has industrial competitiveness. For that reason, the applicability of this article is specific on the supply chain management or material management module modules that are typically exist in many ERP modules.

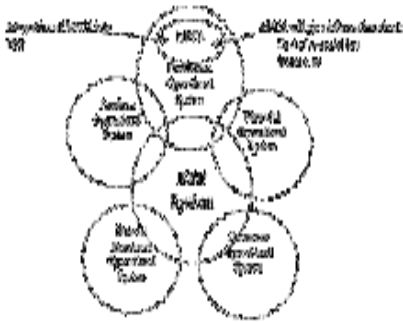


Figure 5. Integration MFCA to ERP System

There are still constraints in supply chain management system to combine with MFCA approach:

1. Technological developments including technological capabilities due to differences in each suppliers and buyers concerns to their manufacturing trading;
2. Awareness of managements in environmental issues;
3. Trend global economy which showed inflationary tendencies, due to global business competition that greatly improved; and
4. The supply chain management system drive a different point of view related to choice for responsive or efficient in business strategy.

## 5. Conclusion and Conclusion

This paper presents a conceptual design of how to integrate MFCA approach into supply chain management system. The benefit of MFCA approach is believed to be of valuable when it is placed in an integrated system

environment. To be precise, where supply chain management module is utilized within an enterprise resources planning system.

We contend that the current paper has potentially pave a way to be further augmented into a more complete conceptual model or a more empirical investigation. Future works could expand the current work by extending the potential of MFCA in a more technically conceptual approach. For example, one could design the MFCA meta representation that needs to be modeled using popular class modeling in the context of supply chain management area. This meta representation could involve object of interest, such as risk, cost, and business process performance metrics.

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**Commented [hr12]:** Saya usul poin ini yang menjadi kontribusi konseptual kita, yakni bagaimana mengintegrasikan konsep MFCA dalam struktur ERP yang ada. [Setuju](#)

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